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Lifetime estimation of a Photovoltaic Module subjected to Corrosion due to Damp Heat Testing

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Titre	Lifetime estimation of a Photovoltaic Module subjected to Corrosion due to Damp Heat Testing
Type de publication	Article de revue
Auteur	Laronde, Rémi [1], Charki, Abderafi [2], Bigaud, David [3]
Editeur	American Society of Mechanical Engineers
Type	Article scientifique dans une revue à comité de lecture
Année	2012
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Mots-clés	Corrosion [4], failure [5], heat [6], reliability [7], Silicon [8], solar energy [9], Stress [10], temperature [11], Testing [12], Weibull distribution [13]
Résumé en anglais	In this paper, a methodology is presented for estimating the lifetime of a photovoltaic (PV) module. Designers guarantee an acceptable level of power (80% of the initial power) up to 25 yr for solar panels without having sufficient feedback to validate this lifetime. Accelerated life testing (ALT) can be carried out in order to determine the lifetime of the equipment. Severe conditions are used to accelerate the ageing of components and the reliability is then deduced in normal conditions, which are considered to be stochastic rather than constant. Environmental conditions at normal operations are simulated using IEC 61725 standard and meteorological data. The mean lifetime of a crystalline-silicon photovoltaic module that meets the minimum power requirement is estimated. The main results show the influence of lifetime distribution and Peck model parameters on the estimation of the lifetime of a photovoltaic module.
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Liens

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